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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,192	03/29/2001	William G. Moon	Q01-1052-US1	7305

7590 10/21/2004  
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EXAMINER

LEE, CHRISTOPHER E

ART UNIT	PAPER NUMBER
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2112

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/822,192	<b>Applicant(s)</b> MOON ET AL.	
	<b>Examiner</b> Christopher E. Lee	<b>Art Unit</b> 2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 21-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Receipt Acknowledgement***

1. Receipt is acknowledged of the Amendment filed on 29<sup>th</sup> of July 2004. Claims 21, 23, 25-28, 31 and 32 have been amended; no claim has been canceled; and no claim has been newly added since the Non-Final Office Action was mailed on 29<sup>th</sup> of March 2004. Currently, claims 21-33 are pending in this application.

### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

In the claim 21, it recites the limitations “each tape cartridge having a predetermined storage capacity” in lines 2-3, and “each hard disk drive defining an electrical data storage capacity at least equal to the predetermined storage capacity of said tape cartridge being emulated” in lines 9-11. However, they are not described in the text disclosure as a proper antecedent basis for the claimed subject matter.

### ***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the double linked list heuristic including pointers to a last file marker and a next file marker in the claim 23, lines 3-4, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs et al. [US 5,684,671 A; hereinafter Hobbs] in view of Yates et al. [US 6,496,791 B1; hereinafter Yates'791].

*Referring to claim 21*, Hobbs discloses a hard disk drive data archive system (i.e., data server in Fig. 4) comprising: a hot pluggable multi-drive magazine (i.e., disk drive rack 50 of Fig. 12; See col. 6, lines 44-47) comprising a housing (i.e., drive cage 56 of Fig. 13) and a plurality of hard disk drives (i.e., disk drives 57 in Fig. 13) installed within said housing (See col. 13, lines 1-4), and each hard disk drive upon installation being connected to receive power and data from said magazine in a controlled fashion (See col. 6, lines 37-47; i.e., wherein in fact that racks do not have to be completely populated, and disk drives are plug-and-play type and hot-swappable, meaning that they can be replaced without turning off data server implies that said hard disk drive upon installation being connected to receive power and data from said magazine in a controlled fashion).

Hobbs does not teach said hard disk drive data archive system is for emulating electrically a tape library including a multiplicity of tape cartridges each having a predetermined storage capacity, and each of said hard disk drives defining an electrical data storage capacity at least equal to said predetermined storage capacity of said tape cartridge being emulated.

Yates'791 discloses an interfaces for an open systems server providing tape drive emulation (See Abstract), wherein a hard disk drive data archive system (i.e., tape drive emulation system (TDE) 10 of Fig. 1A) is for emulating electrically a tape library (See col. 3, lines 9-14) including a multiplicity of tape cartridges (i.e., emulating a plurality of ETDs 55 in Fig. 1B) each having a predetermined storage capacity (i.e., capacity for containing tape data; See col. 3, lines 29-37), and each of a hard disk drives (i.e., staging disks STDs 55 in Fig. 1B) defining an electrical data storage capacity (i.e., capacity for staging VTD on STD; See col. 2, lines 56-63) at least equal to said predetermined storage capacity of said tape cartridge being emulated (See col. 3, lines 24-37; i.e., wherein in fact that a virtual volume is a collection of data (i.e., stored on tape) and metadata (i.e., information generated by OSS) implies that said

electrical data storage capacity (i.e., capacity on staging disk volume STD) is at least equal to said predetermined storage capacity (i.e., capacity for data on said tape cartridge to be emulated via virtual volume VTD)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said tape drive emulation, as disclosed by Yates'791, in said hard disk drive data archive system, as disclosed by Hobbs, for the advantage of providing an interface for a dump of a large amount of data (e.g., administrative data), which is not suitable to real-time short transactions, using a standard access method, such as tape or virtual tape (See Yates'791, col. 1, lines 36-48).

In fact, the limitation "said electrical data storage capacity of said hard disk drive being at least equal to said predetermined storage capacity of said tape cartridge being emulated" recited in the claim does not have any patentable advantage in the specification (See paragraph 4 of the instant Office Action), such as the reason of said electrical data storage capacity being at least equal to said predetermined storage capacity with any patentable advantage, i.e., the Examiner doubts why said electrical data storage capacity cannot be less than said predetermined storage capacity. Therefore, the limitation of "said electrical data storage capacity of said hard disk drive being at least equal to said predetermined storage capacity of said tape cartridge being emulated" in the claim is not patentably significant since it at most relates to the size of electrical data storage capacity under consideration which is not ordinarily a matter of invention. *In re Yount*, 36 C.C.P.A. (Patents) 775, 171 F.2d 317, 80 USPQ 141.

Referring to claim 22, Hobbs, as modified by Yates'791, teaches a magazine receiving system (i.e., rack mount data server 10 in Fig. 1; Hobbs) connected to a host data processing system (i.e., system management unit 70 in Fig. 4; Hobbs) and for physically receiving said magazine (See Hobbs, Fig. 4) and thereupon providing power and data connections to said magazine (See Hobbs, col. 12, lines 11-26), such that when said magazine is received within said magazine receiving system, said hard disk drives selectively receive power and data connections with said magazine receiving system (See Hobbs, col. 6,

lines 37-47; i.e., wherein in fact that racks do not have to be completely populated, and disk drives are plug-and-play type and hot-swappable, meaning that they can be replaced without turning off data server implies that said hard disk drives selectively receive power and data connections (i.e., power and data connections are supplied to the populated hard disk drives) with said magazine receiving system when said magazine is received within said magazine receiving system), and archive system control means (i.e., LMS 60 of Fig. 1B; Yates'791) associated with said magazine receiving system (i.e., rack mount data server) for enabling virtual loading and unloading of said hard disk drives in response to host data processing system commands (i.e., LMS commands) issued to load and unload tape cartridges being emulated (See Yates'791, col. 3, lines 16-28).

6. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs [US 5,684,671 A] in view of Yates'791 [US 6,496,791 B1] as applied to claims 21 and 22 above, and further in view of Yates et al. [US 6,049,848 A; cited by the Applicants; hereinafter Yates'848] and Taylor [US 6,467,025 B1].

*Referring to claim 23*, Hobbs, as modified by Yates'791, discloses all the limitations of the claim 23 except that does not expressly teach said hard disk drive implements a tape file mark structure in hard disk logical block address space as a double linked list heuristic including pointers to a last file marker and a next file marker.

Yates'848 discloses a system and method for performing high-speed tape positioning operations (See Abstract), wherein a hard disk drive (i.e., staging disk STD of Fig. 1A) implements a tape file mark structure (i.e., tapemark table in Fig. 6) in hard disk logical block address space (See col. 5, lines 34-42 and line 66 through col. 6, line 8).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented said tape file mark structure, as disclosed by Yates'848, in said hard disk drive data archive system, as disclosed by Hobbs, as modified by Yates'791, so as to execute a tape file mark

(i.e., tapemark) relative directives at a speed of table look-up (“electronic speed”) instead of a sequential accessing (“mechanical speed”) (See Yates’848, col. 2, lines 13-17).

Hobbs, as modified by Yates’791 and Yates’848, does not teach said tape file mark structure as a double linked list heuristic including pointers to a last file marker and a next file marker.

Taylor discloses a method utilizing doubly-linked loop (See Abstract), wherein a tape file mark structure (i.e., cache lines list in Fig. 2) as a double linked list heuristic including pointers to a last file marker and a next file marker (See col. 4, lines 47-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented said double linked list heuristic, as disclosed by Taylor, for said tape file mark structure, as disclosed by Hobbs, as modified by Yates’791 and Yates’848, for the advantage of providing a set of efficient primitive operations for addressing and manipulating said tape file mark structure (See Taylor, col. 2, lines 37-40).

*Referring to claim 24*, Yates’848 teaches each file mark structure (i.e., tapemark table in Fig. 6) occupies a separate sector in logical block address space (See col. 5, lines 34-42) of said drive (i.e., staging disk STD in Fig. 1A).

7. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs [US 5,684,671 A] in view of Baca et al. [US 5,638,347 A; hereinafter Baca], Blackborow et al. [US 5,253,129 A; cited by the Applicant; hereinafter Blackborow], and Rinard [US 5,894,376 A].

*Referring to claim 25*, Hobbs discloses a method for archiving user data (i.e., functions of data server in Fig. 4) within an active data processing system (i.e., system management unit 70 in Fig. 4) comprising steps of: transferring said user data (i.e., client data) to be archived to a hard disk archive array (i.e., an array of disk drives 57 in Fig. 4) comprising at least one hot pluggable multi-drive magazine (i.e., disk drive rack 50 of Fig. 12; See col. 6, lines 44-47) having a housing (i.e., drive cage 56 of Fig. 13) and a plurality of hard disk drives (i.e., disk drives 57 in Fig. 13) installed within said housing (See col.

13, lines 1-4), each hard disk drive upon installation being connected to receive power and data from said magazine in a controlled fashion (See col. 6, lines 37-47; i.e., wherein in fact that racks do not have to be completely populated, and disk drives are plug-and-play type and hot-swappable, meaning that they can be replaced without turning off data server implies that said hard disk drive upon installation being connected to receive power and data from said magazine in a controlled fashion); and, a magazine receiving system (i.e., rack mount data server 10 in Fig. 1) connected to said active data processing system (i.e., system management unit) for physically receiving said magazine (See Fig. 4) and thereupon providing power and data connections to said magazine (See col. 12, lines 11-26), such that when said magazine is received within said magazine receiving system, said hard disk drives selectively receive power and data connections with said magazine receiving system (See col. 6, lines 37-47; i.e., wherein in fact that racks do not have to be completely populated, and disk drives are plug-and-play type and hot-swappable, meaning that they can be replaced without turning off data server implies that said hard disk drives selectively receive power and data connections (i.e., power and data connections are supplied to the populated hard disk drives) with said magazine receiving system when said magazine is received within said magazine receiving system).

Hobbs does not teach removing said magazine from said magazine receiving system connected to said active data processing system following completion of transfer of user data to be archived; installing said magazine in a data preservation vault.

Baca discloses a storage library system (Fig. 8), wherein a picker system 22 (Fig. 3) performs removing a magazine (i.e., a cartridge or magazine 15 in Fig. 1) from a magazine receiving system (i.e., library device 10 in Fig. 1) connected to an active data processing system (i.e., drive unit 20 of Fig. 1) following completion of transfer of user data to be archived (See col. 3, lines 19-22); installing said magazine in a data preservation vault (i.e., receptacle columns 11 and 12 in Fig. 1).



Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said picker system, as disclosed by Baca, in said active data processing system, as disclosed by Hobbs, so as a picker mechanism in said picker system to move said magazine (i.e., media) into and from said active data processing system (i.e., drive unit; See Baca, Abstract), which provides the advantage of sharing said active data processing system among said plurality of multi-drive magazines (i.e., cartridges or magazines).

Hobbs, as modified by Baca, does not teach said data preservation vault is in a secure location remote from a location of said active data processing system; and, periodically and selectively applying power to each one of said hard disk drives installed within said magazine in said data preservation vault during a drive testing interval, and carrying out drive performance checks upon a said drive during said drive testing interval.

Blackborow discloses a removable and transportable hard disk subsystem (See Abstract and Fig. 1), wherein a data preservation vault (i.e., the premises containing the system be secured against all intrusion) is in a secure location remote from a location of an active data processing system (i.e., from a location of large office building; See col. 1, line 55 through col. 2, line 8 and col. 3, lines 59-68).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied said concept of security using said removable and transportable hard disk subsystem, as disclosed by Blackborow, to said active data processing system, as disclosed by Hobbs, as modified by Baca, for the advantage of providing a high security of said user data (i.e., files) from those who might seek access to privileged information (See Blackborow, col. 1, lines 21-28).

Hobbs, as modified by Baca and Blackborow, does not teach periodically and selectively applying power to each one of said hard disk drives installed within said magazine in said data preservation vault during a drive testing interval, and carrying out drive performance checks upon a said drive during said drive testing interval.

Rinard discloses an apparatus and method for monitoring read/write reliability of data storage device (See Abstract and Figs. 6 and 6A), wherein said method performs the step of periodically and selectively applying power to each one of hard disk drives (i.e., player/recorder devices 22, 24, 26 and 28 in Fig. 3) installed within a magazine (i.e., slot 74 of Fig. 3) in a data preservation vault (i.e., data cartridge library system 16 in Fig. 3) during a drive testing interval (i.e., during diagnostic test), and carrying out drive performance checks upon said drive during said drive testing interval (See col. 8, lines 33-46).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied said concept of periodic drive testing (i.e., periodic diagnostic test), as disclosed by Rinard, to said active data processing system, as disclosed by Hobbs, as modified by Baca and Blackborow, so as to identify said hard disk drives (i.e., player/recorder devices) experiencing read/write reliability problems (See Rinard, col. 8, lines 38-41).

*Referring to claim 26*, Rinard teaches read-verifying (i.e., read/write confidence test) archived data stored on said one of said hard disk drives being performance checked (See col. 8, lines 47-50).

8. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs [US 5,684,671 A] in view of Baca [US 5,638,347 A], Blackborow [US 5,253,129 A], and Rinard [US 5,894,376 A] as applied to claims 25 and 26 above, and further in view of Tuttle [US 6,281,685 B1].

*Referring to claim 27*, Hobbs, as modified by Baca, Blackborow and Rinard, discloses all the limitations of the claim 27 including said read-verifying (i.e., read/write confidence test) archived data stored on said one of said hard disk drives is carried out by said archive magazine receiving system with said drive (See Rinard, col. 8, lines 47-50), except that does not teach said read-verifying is performed using a limited bandwidth data and control connection.

Tuttle discloses a cable shield fault locator (See Abstract and Fig. 1), wherein read-verifying (i.e., generating electrical signal current and detecting a disturbance in the magnetic field; See col. 3, lines 6-14) is performed using a limited bandwidth data and control connection (See col. 4, lines 23-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said step of read-verifying (i.e., locating cable shield fault), as disclosed by Tuttle, in said archiving method, as disclosed by Hobbs, as modified by Baca, Blackborow and Rinard, for the advantage of providing for testing the cable shielding for electromagnetic integrity, and that can be used without disconnecting the cable under test (See Tuttle, col. 2, lines 47-51).

*Referring to claim 28*, Tuttle teaches the step of read-verifying archived data stored on said one of said hard disk drives (i.e., locating cable shield fault) is carried out by sending control signals (i.e., generating electrical signal current) to said drive (i.e., electronics unit 22 of Fig. 1) from an archive computer associated with said archive magazine receiving system (i.e., electronics unit 20 of Fig. 1) and receiving status and user data from said drive at said archive computer (i.e., detecting a disturbance in the magnetic field; See col. 3, lines 4-17).

9. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs [US 5,684,671 A] in view of Baca [US 5,638,347 A], Blackborow [US 5,253,129 A], Rinard [US 5,894,376 A] and Tuttle [US 6,281,685 B1] as applied to claims 27 and 28 above, and further in view of Yates'791 [US 6,496,791 B1].

*Referring to claim 29*, Hobbs, as modified by Baca, Blackborow, Rinard and Tuttle, discloses all the limitations of the claim 29, except that does not expressly teach said archive computer having a network connection to an active data processing system and comprising further steps of receiving an archived user data file retrieval request from said active data processing system via said network connection, retrieving said archived user data file from at least one of said hard disk drives of a magazine installed in said archive magazine receiving system and sending said retrieved archived user data file to said active data processing system via said network connection.

Yates'791 discloses an interfaces for an open systems server providing tape drive emulation (See Abstract), wherein an archive computer having a network connection (i.e., subsystem interface 55a and

device interface 57 in Fig. 1B) to an active data processing system (i.e., Host 50 of Fig. 1B) and receiving an archived user data file retrieval request from said active data processing system (i.e., data access request from APPLs 52 in Fig. 1B) via said network connection (i.e., subsystem interface and device interface), retrieving said archived user data file (i.e., Application Data) from at least one of hard disk drives of a magazine (i.e., STDs in Fig. 1B) installed in an archive magazine receiving system (i.e., ATL 54 of Fig. 1B) and sending said retrieved archived user data file to said active data processing system via said network connection (See col. 3, line 1 through col. 4, line 14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method steps of tape drive emulation, as disclosed by Yates'791, in said archiving method, as disclosed by Hobbs, as modified by Baca, Blackborow, Rinard and Tuttle, for the advantage of providing an interface for a dump of a large amount of data (e.g., administrative data), which is not suitable to real-time short transactions, using a standard access method, such as tape or virtual tape (See Yates'791, col. 1, lines 36-48).

10. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs [US 5,684,671 A] in view of Baca [US 5,638,347 A], Blackborow [US 5,253,129 A], and Rinard [US 5,894,376 A] as applied to claims 25 and 26 above, and further in view of Yates'791 [US 6,496,791 B1].

*Referring to claim 30*, Hobbs, as modified by Baca, Blackborow and Rinard, discloses all the limitations of the claim 30 except that does not teach the step of emulating a cartridge tape library and including the step of assigning each said hard disk drive to emulate a tape cartridge of said cartridge tape library.

Yates'791 discloses an interfaces for an open systems server providing tape drive emulation (See Abstract), wherein emulating a cartridge tape library (i.e., tape drive emulation system (TDE) 10 of Fig. 1A; See col. 3, lines 9-14) and assigning a hard disk drive (i.e., staging disks STDs 55 in Fig. 1B) to emulate a tape cartridge of said cartridge tape library (i.e., emulating a plurality of ETDs 55 in Fig. 1B).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included said method steps of tape drive emulation, as disclosed by Yates'791, in said archiving method, as disclosed by Hobbs, as modified by Baca, Blackborow and Rinard, for the advantage of providing an interface for a dump of a large amount of data (e.g., administrative data), which is not suitable to real-time short transactions, using a standard access method, such as tape or virtual tape (See Yates'791, col. 1, lines 36-48).

*Referring to claim 31*, Yates'791 teaches assigning each hard disk drive (i.e., staging disk STD in Fig. 1B) to emulate a tape cartridge (i.e., emulating a plurality of ETDs 55 in Fig. 1B) is carried out by associating said hard disk drive with a single tape cartridge (See col. 2, lines 56-63) of a cartridge tape library (i.e., ATL 54 of Fig. 1B).

11. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hobbs [US 5,684,671 A] in view of Baca [US 5,638,347 A], Blackborow [US 5,253,129 A], Rinard [US 5,894,376 A] and Yates'791 [US 6,496,791 B1] as applied to claims 30 and 31 above, and further in view of Yates'848 [US 6,049,848 A] and Taylor [US 6,467,025 B1].

*Referring to claim 32*, Hobbs, as modified by Baca, Blackborow, Rinard and Yates'791, discloses all the limitations of the claim 32 except that does not expressly teach implementing a tape file mark structure in logical block address space of said hard disk drive as a double-linked-list heuristic including pointers to a last file marker and a next file marker.

Yates'848 discloses a system and method for performing high-speed tape positioning operations (See Abstract), wherein a hard disk drive (i.e., staging disk STD of Fig. 1A) implements a tape file mark structure (i.e., tapemark table in Fig. 6) in logical block address space of hard disk drive (See col. 5, lines 34-42 and line 66 through col. 6, line 8).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented said tape file mark structure, as disclosed by Yates'848, in said archiving

method, as disclosed by Hobbs, as modified by Baca, Blackborow, Rinard and Yates'791, so as to execute a tape file mark (i.e., tapemark) relative directives at a speed of table look-up ("electronic speed") instead of a sequential accessing ("mechanical speed") (See Yates'848, col. 2, lines 13-17).

Hobbs, as modified by Baca, Blackborow, Rinard, Yates'791 and Yates'848, does not teach said tape file mark structure as a double linked list heuristic including pointers to a last file marker and a next file marker.

Taylor discloses a method utilizing doubly-linked loop (See Abstract), wherein a tape file mark structure (i.e., cache lines list in Fig. 2) as a double linked list heuristic including pointers to a last file marker and a next file marker (See col. 4, lines 47-53).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have implemented said double linked list heuristic, as disclosed by Taylor, for said tape file mark structure, as disclosed by Hobbs, as modified by Baca, Blackborow, Rinard, Yates'791 and Yates'848, for the advantage of providing a set of efficient primitive operations for addressing and manipulating said tape file mark structure (See Taylor, col. 2, lines 37-40).

*Referring to claim 33, Yates'848 teaches recording each file mark structure (i.e., tapemark table in Fig. 6) within a separate sector in logical block address space (See col. 5, lines 34-42) of said drive (i.e., staging disk STD in Fig. 1A).*

### ***Response to Arguments***

12. Applicants' arguments filed on 29<sup>th</sup> of July 2004 (hereinafter the Response) have been fully considered but they are not persuasive.

*In response to the Applicants' argument with respect to "... In response, Applicants submit that the specification indeed supplies proper antecedent basis for the claimed subject matter. For example, paragraph [0069] describes that 'Ideally, each hard disk drive unit 20 provides 10 Gigabytes, or more, of data storage ... which equals or exceeds a contemporary data backup tape cartridge having a similar*

external form factor.’ (Emphasis added). Further, paragraph [0095] describes that each magazine holding a complement of hard disk drives emulate a like complement of tape cartridges. The specification therefore clearly describes that ...” on the Response page 6, lines 8-23, the Examiner respectfully disagrees.

In contrary to the Applicants’ statement, the paragraph [0069] on page 18, lines 19-22, does not specify each tape cartridge having a predetermined storage capacity, which is recited in the claim 21, lines 2-3, and each hard disk drive defining an electrical data storage capacity at least equal to the predetermined storage capacity of said tape cartridge being emulated, but discloses each hard disk drive having a predetermined storage capacity, and each non-emulated tape cartridge having a similar form factor (i.e., a similar size) defining an electrical data storage capacity at least equal or less than the predetermined storage capacity of said hard disk drive.

Furthermore, the paragraph [0095] on page 33, line 19 through page 34, line 3, does not provide the subject matter “predetermined storage capacity” for each tape cartridge.

Therefore, the Applicants’ argument on this point is not persuasive, and the specification is objected to as failing to provide proper antecedent basis for the claimed subject matter (See 37 CFR 1.75(d)(1) and MPEP § 608.01(o)). The Examiner respectfully requests a correction of the specification without introducing a new matter.

*In response to the Applicants’ argument with respect to Drawing Objection on the Response page 7, lines 1-9, the Examiner respectfully disagrees.*

The Applicants claim the subject matter “double linked list heuristic” including “pointers to a last file marker and a next file marker” in the claim 23. However, the Fig. 14 does not show a pointer to a last file marker, and the Fig. 15 does not specify the claimed subject matter “a pointer to a last file marker”. Instead, the Fig. 15 only specifies “a pointer to a previous filemark” and “a pointer to a next filemark”. Thus, the Applicants’ argument on this point is not persuasive.

*In response to the Applicants' argument with respect to* "First, the references, alone or in combination, fail to disclose or suggest a hard disk drive data archive system for emulating electrically a tape library including 'a hot pluggable multi-drive magazine' ... Applicants respectfully disagrees and submit that Hobbs, in fact, does not disclose or suggest 'a hot pluggable multi-drive magazine,' as recited by claim 21. ... Hobbs discloses in Figure 13 and column 6, lines 36-49, that 'disk drives 57 preferably are of the plug-and-play type and preferably are hot-swappable,' but Hobbs fails to disclose a multi-drive magazine that is hot-swappable. ..." on the Response page 7, line 22 through page 8, line 13, the Examiner respectfully disagrees.

In fact, the subject matter "a hot pluggable multi-drive magazine" could be broadly interpreted such as "multi-drive magazine" not only having a hot plug-ability on itself, but also providing a feature of hot plug-ability for drives to be plugged in it, as well.

Therefore, it is noted that the features upon which applicants rely (i.e., a multi-drive magazine that is hot-swappable) are not clearly recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Thus, the Applicants' argument on this point is not persuasive.

*In response to the Applicants' argument with respect to* "Second, the references, alone or in combination, fail to disclose or suggest a hard disk drive data archive system for emulating electrically a tape library including each hard disk drive defining an electrical data storage capacity at least equal to the predetermined storage capacity of said tape cartridge being emulated,' as recited by claim 21. ... Applicants respectfully disagree with the Examiner. The portion of Yates' 791 cited by the Examiner discloses merely that host data is stored in 'virtual volumes ... indistinguishable from real tape volumes by the host computer.' ... This portion of Yates' 791 clearly fails to disclose or suggest 'each hard disk drive defining an electrical data storage capacity at least equal to the predetermined storage capacity of



said tape cartridge being emulated.' ...” on the Response page 8, lines 14-26, the Examiner respectfully disagrees.

In contrary to the Applicants' statement, Yates'791 suggests a tape drive emulation system (TDE) (i.e., a hard disk drive data archive system) is for emulating electrically a virtual tape drive (VTD) (i.e., tape library; See Yates'791, col. 3, lines 9-14) including a plurality of ETDs (i.e., a multiplicity of tape cartridges) each having a capacity for containing tape data (i.e., a predetermined storage capacity; See Yates'791, col. 3, lines 29-37), and each of staging disks STDs (i.e., hard disk drives) defining a capacity for staging VTD on STD (i.e., an electrical data storage capacity; See Yates'791, col. 2, lines 56-63) at least equal to said capacity for containing tape data to be emulated via virtual volume VTD (i.e., predetermined storage capacity of said tape cartridge being emulated; See Yates'791, col. 3, lines 24-37; wherein in fact that a virtual volume is a collection of data (i.e., stored on tape) and metadata (i.e., information generated by OSS) impliedly suggests that said electrical data storage capacity (i.e., capacity on staging disk volume STD) is at least equal to said predetermined storage capacity (i.e., capacity for data on said tape cartridge to be emulated via virtual volume VTD)).

Accordingly, the combination of Hobbs and Yates'791 with rationale suggests all the limitations of the claim 21 (See paragraph 5 of the instant Office Action, claims 21 and 22 rejection under 35 U.S.C. 103(a) as being unpatentable over Hobbs in view of Yates'791).

Thus, the Applicants' argument on this point is not persuasive.

*In response to the Applicants' argument with respect to* “Third, Applicants submit that the Examiner has failed to establish a teaching, suggestion, or motivation to combine the teachings of Hobbs and Yates'791, and has therefore failed to present a *prima facie* case of obviousness. ...” on the Response page 8, line 27 through page 9, line 22, the Examiner respectfully disagrees.

In contrary to the Applicants' statement, all the rejections under 35 USC §103(a) in the prior and the instant Office Action established a *prima facie* case of obviousness meeting the three basic criteria of the

MPEP 2143.03 (8<sup>th</sup> ed. 2001). Furthermore, the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). Furthermore, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the Applicants' disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In this case, the Examiner has clearly pointed out rationale for appropriate combination of the references. Thus, the Applicants' argument on this point is not persuasive.

*In response to the Applicants' arguments with respect to Claims 23, 24 and 27-33 rejection on the Response pages 9, 11 and 12, the Applicants' arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.* Thus, the Applicants' arguments on these points are not persuasive.

*In response to the Applicants' argument with respect to Claims 25 and 26 on the Response page 10, line 4 through page 11, line 3, the Examiner respectfully disagrees.*

As discussed above, the subject matter "a hot pluggable multi-drive magazine" could be broadly interpreted such as "multi-drive magazine" not only having a hot plug-ability on itself, but also providing a feature of hot plug-ability for drives to be plugged in it, as well.

Therefore, it is noted that the features upon which applicants rely (i.e., a multi-drive magazine that is hot-swappable) are not clearly recited in the rejected claims. Although the claims are interpreted in light of

the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Moreover, in contrary to the Applicants' statement, all the rejections under 35 USC §103(a) in the prior and the instant Office Action established a *prima facie* case of obviousness meeting the three basic criteria of the MPEP 2143.03 (8<sup>th</sup> ed. 2001), and the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In addition, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the Applicants' disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In this case, the Examiner has clearly pointed out rationale for appropriate combination of the references (See paragraph 7, Claims 25 and 26 rejection under 35 U.S.C. 103(a) as being unpatentable over Hobbs in view of Baca, Blackborow and Rinard).

Thus, the Applicants' argument on this point is not persuasive.

### ***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH

shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

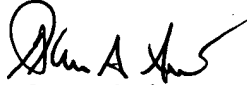
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher E. Lee whose telephone number is 571-272-3637. The examiner can normally be reached on 9:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark H. Rinehart can be reached on 571-272-3632. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cel/ *CEL*

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